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*for the health sciences*

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# *The Doctor's Tools: From Saddlebag to Hospital*

*Estelle Brodman*

*The Country Doctor,* by A. R. Waud, from *Harper's Weekly* 13:495, 1869. (Photo courtesy of National Library of Medicine.)

# *The Doctor's Tools: From Saddlebag to Hospital*

*by Estelle Brodman*

Before the Revolutionary War, American physicians were trained through apprenticeship with local physicians who practiced not only the art of medicine but also performed surgery and prepared medicines. A number of physicians had studied at one of the two medical schools then in existence in the United States—King's College (now Columbia University in New York City) or the Philadelphia Medical School (now the University of Pennsylvania). Others were fortunate to be able to supplement their training abroad at medical schools in Edinburgh and Leyden or the great hospitals of London. After their formal study, these students often made a grand tour of the Continent, buying medical books and instruments to take back with them to America.

Philadelphia medical students John Morgan (1735-1789) and William Shippen (1712-1801) returned home in the 1760s to propose for the colonies the same system of specialization which they had found in Europe. With such a system, physicians would be distinguished in training and in practice from surgeons and from apothecaries. In a commencement address advocating the European system, John Morgan announced to graduates of the Philadelphia Medical School that he personally would not practice surgery or pharmacy, but would act only as a physician.[1] Although these three distinctions of healers are well recognized today, Morgan's proposal was not accepted for many years, mainly because he had failed to take into account the physical conditions of the country in the late eighteenth and early nineteenth centuries. Pioneer life did not allow the luxury of specialization—the small number of individuals residing in any one place necessitated the sharing of all work by everyone.[2] The farmer needed also to be a wheelwright; the miller a breeder of cattle; the physician, lawyer or school teacher needed also to be a smith or tailor. No one could make a living by working full-time at one particular calling; no pioneer society could have lasted without multifarious tasks assigned to each individual.

Because of this fact, pioneer physicians made no attempt to limit their practices, but attempted to treat whatever conditions came to their attention. William Beaumont (1785-1853), who served as an Army physician in the Territory of Michigan in the 1820s, was the only doctor within a radius of several hundred miles. Thus it was no surprise that he cared for injured French-Canadian trapper Alexis St. Martin with no thought of calling in anyone else.[3] Harsh frontier conditions produced doctors who were resourceful and likely to act with assurance and self-confidence, whatever their patients' trauma or illness.

The dearth of population made it difficult to bring the sick to one place where a physician could prescribe for a large number of people; therefore, it was necessary for physicians to visit the sick at their homes. Primitive roads, or often the absence of roads completely, hampered travel to more remote habitations. As a result, frontier doctors could not travel about in carriages, as was the case in England at this time, where physicians' rich equipage, liveried servants, and powdered and wigged faces were the object of many popular poems, ballads and caricatures. Nor were the British coffeehouses, where physicians congregated to be consulted by patients or to discuss cases with other physicians, to be found in the trackless forests of trans-Appalachian America, the vast lands of the Louisiana Purchase, or in the small towns springing up on the banks of rivers everywhere.

Frontier physicians had to travel on foot or on horseback, and take with them all that was needed for diagnosis and treatment.[4] Even though reliance on instrumentation for physical diagnosis was less prominent in the nineteenth century than in the early twentieth, lack of equipment could be a serious problem. There was only so much to be learned about patients' conditions by observation and physical diagnosis; there was even less doctors could to for their patients if they did not have the requisite medicaments or instruments at their disposal. Also, since physicians often did not know what conditions they would find, they had to carry along a large variety of instuments and medicines which experience had taught them served to treat the most common ailments and traumas.

A heavily-laden saddlebag precipitated another problem, though. Physicians on horseback could only carry a certain amount of weight without causing their animals to founder. Since saddlebags often were subjected to harsh conditions (for example, adverse weather conditions and jolts from a moving animal), containers for the precious instruments and medicaments had to be sturdy as well as lightweight. Saddlebags and carrying cases for equipment on

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Advertisements such as this one are marvelous examples of the directness of enterprising salesmanship. (Photo courtesy of National Library of Medicine.)

display in numerous historical museums demonstrate the ingenious way in which manufacturers designed their products so as to make certain that nothing was dislodged once the precious cargo was put on horseback and that inclement weather and harsh treatment would not negate the usefulness of their contents. Instruments were set in grooves lined with cloth or velvet and imbedded in boxes, or placed in leather containers which were then wrapped around them.

Other instruments illustrate the existence both of sturdy craftsmen and sensitive patrons who could appreciate the work which went into fashioning such beautiful though utilitarian objects. Museum collections of longhandled ivory urological instruments, nested brass weights for measuring drugs, and ophthalmological kits provide fine examples of the extent of craftsmanship reached in the eighteenth and nineteenth centuries. (See Fig. 3.) Many of these artifacts are hand-carved and delicately adorned with ivory or bone, suggesting the degree of respect with which the physicians who purchased them would hold for their instruments. Not until the introduction of aseptic techniques by Joseph Lister (1827-1912) and his followers in the late nineteenth century did elaborate decoration give way to the simplicity of modern-day medical and surgical instruments.

It is sometimes forgotten that the western states did not have the population density required for statehood until the turn of the twentieth century. Physicians practicing in Wyoming or Oregon in the 1890s, for example, encountered many of the same conditions that pioneers further east had lived through nearly a hundred years earlier. In fact, there are probably a few physicians still practicing in these areas today who have used the entire gamut of available transportation, from saddlebags and horses to portable EKG machines and helicopters, to get to their patients. Only in Alaska is a different tradition evident: there transportation of the sick and wounded seems to have advanced directly from dog sleds to airplanes.

Wars naturally bring with them situations which provide both classroom and laboratory experiences for physicians and surgeons. Designated the most lethal war until World War I, the Civil War gave medical officers in the army and navy opportunities to improve their surgical skills. Yet the equipment brought close to the battlefield by horse-drawn wagon and then taken in boxes to the front lines is strikingly familiar to instruments shown in Ambroise Paré's (1517-1590) great treatise on surgery.[5] How little instruments had changed in almost three hundred years!

Because the pioneer world of the early nineteenth century did not provide for "drug stores" close by, and because drugs were seldom standardized in strength, most American physicians of this period carried with them basic ingredients for making their own pills, ointments and boluses. Hand-held scales and boxes of weights, as well as mortars and pestles, were basic equipment often carried on horseback.

Before physicians set up practice in individual communities and established pharmacies, many frontier families kept home medicine chests. Providing marvelous examples of domestic medicines and artifacts, these chests were used by physicians and families alike. They were found on plantations and on ships at sea where physicians were unavailable. Later modifications in the chests—a reflection of a more sedentary lifestyle—were heavier, had legs, brass plates and other metal decoration, and were painted.

## DISEASES ENCOUNTERED AND THEIR TREATMENT

What were the complaints which saddlebag physicians encountered, and how were they treated? A number of physicians' day books and account books provide an accurate picture of a normal rural practice during this period. For example, Dr. Charles Chandler (1806-1879) of Woodstock, in McHenry County, Illinois noted in his journal of charges for September, 1838 that he dispensed medicines for ague, dysentery and coughs and had set a broken limb ("for a man at Beard's"). He prescribed "ague medicine," quinine, Dover's powders (an opium mixture), a "draught," and "spirits of nitre" (actually ethyl nitrite, an antispasmotic), among other things. These medicines were for patients "during the night," "over river," in Salem, at Princeton, at "David Carr's" or "the Widow Watson's," as well as for other local settlers cited by name. Charges varied in accordance with distance travelled, time of day, and medicines given.

As might be expected from topographical and physical conditions in early Illinois, the most common causes for calling the doctor were trauma, fevers of various kinds, and children's diseases. His journal indicates that Dr. Chandler used the commonly-accepted treatments for these ailments. In the journal of another well-known physician, William Beaumont wrote of treating fevers: one patient received calomel and ipecac, repeated draughts of gruel and acidulated drinks, had vinegar rubs to his feet and was bled twelve ounces. (He recovered.) For another patient, a heart

Ivory-handled urological instruments. (Photo courtesy of The Pearson Museum.)

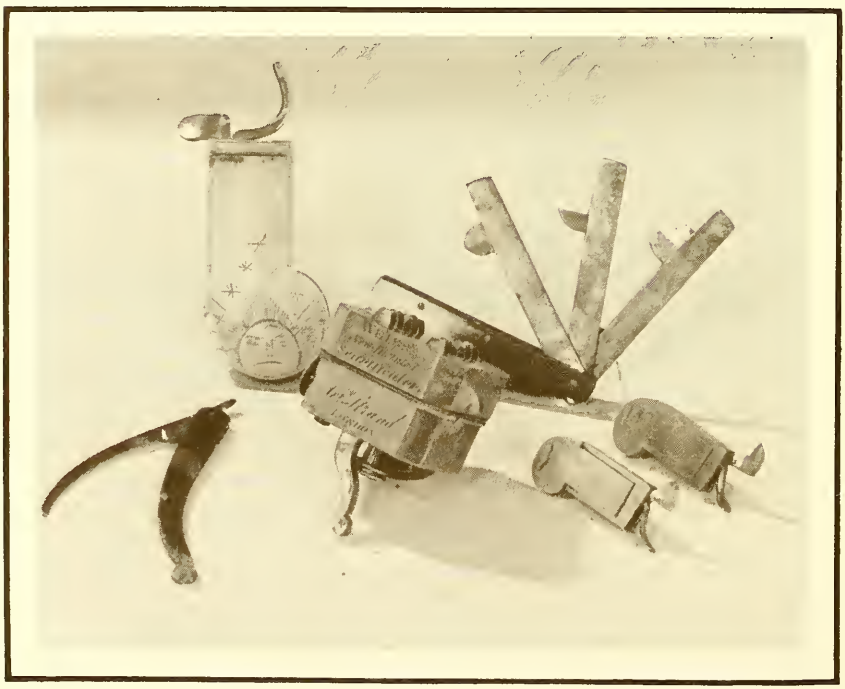
attack victim, Beaumont's treatment was to bleed him twelve ounces also, and order hot applications to the breast and pericardium. Later entries in this journal describe two cases of measles in children, and another of a patient infected from the bite of a cat. In the latter case, rabies was suspected and so the poor patient was blistered and dosed with calomel, ipecac and nitre. She had a stormy illness of six weeks duration, but finally recovered—whether due to Beaumont or to her own strong constitution will never be known.[6]

In *The Midwest Pioneer: His Ills, Cures and Doctors*, Madge Pickard and R. Carlyle Buley list smallpox, measles and scarlatina, malaria and influenza as the most common and the most devastating illnesses.[7] In *Martin Chuzzelwit*, Charles Dickens gives an outsider's view of the general unhealthiness he encountered in the pioneer Midwest, noting that "the ague" was so common that most people treated it themselves, without recourse to physicians.

Mercurials (such as calomel or Dover's powders), purgatives of various kinds (such as the ubiquitous "10 and 10," which was 10 grains of jalap and 10 grains of calomel) and "the bark," or quinine, were used both by physicians in their treatments and by families with no access to doctors—prescribed from their home medicine chests and from books written for laymen. Examples of these texts include Buchan's *Domestic Medicine*,[8] a book which went through more than twenty editions and was tailored specifically to the needs of the Midwest pioneer by Dr. Anthony Benezet of Philadelphia; and Gunn's *Domestic Medicine* first published in 1830 and still selling well in its 213th edition in 1885! Similar works were published in various places as the frontier was moved steadily westward.

Based on entries in his journal, it seems that Dr. Charles Chandler certainly was up-to-date in his treatment of the "ague"—the universal chills and fever of malaria so prevalent in the undrained Midwest. Although cinchona ("Jesuit's bark") had been known since the seventeenth century and was used by British physician Thomas Sydenham (1624-1689) and others of his time, the actual chemical extraction of quinine from the bark did not take place until 1820 in Paris and was not available in the United States until 1824. It was not until 1832 that Dr. John Sappington (1776-1856), the pioneer physician from Arrow Rock, Missouri, published a book on the use of quinine. (Dr. Sappington also sold "ague pills," which were actually quinine.) By 1833, Dr. Chandler was apparently prescribing quinine for patients in backwoods Illinois. It would be interesting to know from which sources he obtained quinine, so as to ascertain whether his common prescription of "ague medicine"

Brass bleeding bowls, a spring lancet, and cupping glasses. (Photo courtesy of The Pearson Museum.)



A fleam, scarificators and other bleeding devices. (Photo courtesy of The Pearson Museum.)

contained this drug or something else. Since quinine at this time sold for $6 to $8 per ounce in Detroit and elsewhere, Dr. Chandler probably diluted it with other drugs.

Bleeding was another standard practice in eighteenth and early nineteenth-century American medical practice. However, unlike the pragmatic basis for the use of quinine, bleeding was based on the theory of the four humors, which in turn was based on the four classical elements: earth, air, fire and water. According to this theory the four elements—when mixed with heat and humidity—resulted in the four humors: blood, phlegm, black bile and yellow bile. The humoral theory held that in a state of health the humors would be in normal proportions, while in disease one or more of them would be present in too large or too small a proportion. This effect could be due to spasms or laxity in the tissues of the body. A study of the disease would indicate which of the humors was at fault, and thus indicate which therapeutic measures might be taken to bring the humors back in balance. Bloodletting was one therapeutic measure. Actually, humoral theory was the basis for belief in regular, preventive bloodletting, a practice in European monastaries almost from their moment of inception. Monks would be bled at propitious (usually monthly) intervals as a preventive measure; there still exist many bloodletting calendars from this period, some of them handsomely illustrated in color.

The most outstanding exponent of bloodletting in the eighteenth century was probably Thomas Sydenham of London, whose theories the American physician Benjamin Rush (1745-1813) brought back with him from his study in Britain. Rush propounded the theory that bleeding until debilitation and fainting occurred was essential to expel the noxious elements causing yellow and other fevers, and to bring the humors of the body into correct relationship with each other. Other followers of the theory of "heroic bloodletting," as it came to be called, recommended this treatment for a wide variety of additional diseases, including inflammatory fevers, coughs, headaches, rheumatism, abscesses, some forms of heart disease, "putrid sore throat" (probably diphtheria), and even wounds of the chest. Indeed, it has been said that bleeding and purging were the most common forms of treatment in early America, and many Midwestern pioneers had multiple scars from repeated phlebotomies.

Instruments for bleeding include lancets, scarificators and cupping sets. Lancets initially were the small knives with which a vein was opened. Later manufacturers of lancets placed a series of small knives in a metal block, with a spring to hold them in place. When

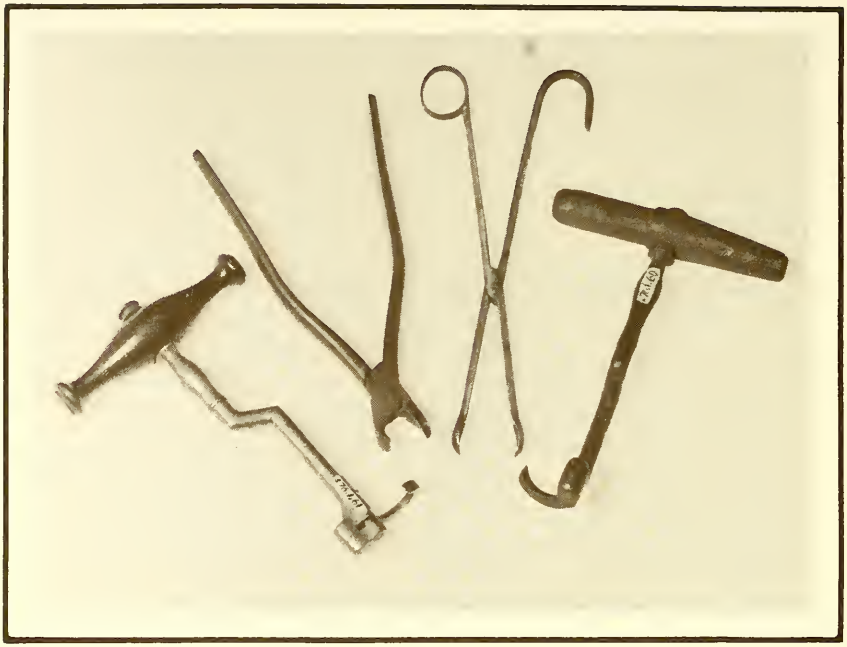
Wooden model of Laennac's first stethoscope and examples of later types. (Photo courtesy of The Pearson Museum.)

the spring was released, the lancet made a series of simultaneous cuts in the skin. Cupping, like the moxa treatment of the Chinese, involved the application of heat to the skin to produce blistering and evacuation of blood and lymph. Cupping instruments could be of glass or metal; some had stopcocks for evacuating air and others were bell-shaped. Leeches provided yet another means of bloodletting, and were generally stock items for pharmacists and physicians.

## DIAGNOSTIC INSTRUMENTS OF PIONEER PHYSICIANS

Early American physicians had only a few diagnostic instruments at their disposal. The stethoscope, first invented in 1819 by the great French clinician René Theophile Laennec (1781-1826), originally was a roll of paper used to listen to the heart beat. Certainly physicians who had the use of the new stethoscope felt more at ease with it than with placing an ear against the chest of a female patient—the usual method of examination of the heart. Stethoscopes also made possible a clearer, more audible sound of the heartbeat than did direct auscultation and allowed for more scientific decisions. This simple roll of paper quickly gave way to more elaborate methods of conveying sounds to the ear. Early stethoscopes were wood cylinders, sometimes in beautiful wooden cases. Somewhat later an earpiece was added and the front end of the instrument flared. Later the original monaural tube was replaced by a binaural set of tubes from a common bulb. In the binaural stethoscope, a single flexible tube led from the hard-rubber bell placed upon the patient's body to a metal container which separated into two rubber tubes, and from there went to the earpieces for the physician's head. The most elaborate stethoscopes had metal springs, often covered by knitted "stockings," to bring the sound from the bell to the ear or to hold the tubes apart and in place.

Thermometers were also available, although these instruments were not used frequently in routine medical practice until the third quarter of the nineteenth century.[9] For example, in the 1820s and 1830s, William Beaumont performed all of his experiments on gastric juices with no equipment except a thermometer and a sand bath to keep the juice at the right temperature. Thermometers were uncommon in the United States until after the Civil War, and so saddlebag doctors often relied upon feeling their patients' skin directly or estimating the degree of heat from color or other physical signs.



Toothkeys and bullet forceps are just a few examples of early extracting instruments. (Photo courtesy of The Pearson Museum.)

Civil War amputation kit. Contained in sturdy, plush-lined walnut, cherry or mahogany cases, these instruments were in common use from the Civil War period into the twentieth century. An 1893 catalog lists them as costing from $14.00 to $40.00. (Photo courtesy of The Pearson Museum.)

The microscope, another instrument in existence in the first part of the nineteenth century, also was unlikely to be used by rural physicians. (Even so prestigious an institution as Harvard University Medical School failed to use microscopes for the education of its students until the 1880s.) At first little more than a scientific curiosity, microscopes by the turn of the century were being utilized to examine blood, urine and stool samples by the more "scientific," up-to-date doctors.

Using the simple instruments that could be carried with them, frontier doctors based their diagnosis on data acquired by asking questions about the onset of symptoms, listening to the heart, and if appropriate, counting the pulse, and noting the character of the breathing, the physical condition of the tongue, any obvious bleeding, changes in skin color, swelling, or other physical manifestations of pathological change. Occasionally the urine might be examined for color and sediment.

## TAKING CARE OF THE PATIENT

Early settlers in the western (now Midwestern) United States lived at great distances from one another and often had no access to doctors. Consequently, people relied on self-taught lay practitioners or learned "doctoring" for themselves. Almost universally, self-treatment took place in the home for all but the sickest or the poorest of settlers. Even if the doctor had come, had diagnosed the illness and prescribed for it, it was still up to the family of the sick person to provide the care and to follow through with his recommendations.

Much of the care available in modern hospitals was provided in pioneer homes. Surgeons, particularly those in rural areas, often operated on tables in farm kitchens, with family members giving the anesthesia. Patients were nursed by their wives, mothers, servants, or other household attendants. Therefore, most homes stocked equipment which would make caring for the sick and handicapped easier: commodes, invalid chairs, feeding devices, medicine containers, hearing devices—silver, brass, and tortoise shell which were passed on to succeeding generations—supplemental heating equipment, etc. Since many of these were used over and over again, they were made with the same care and spirit as other household articles. Invalid feeding plates and pots, for example, were often hand-decorated Meissenware or pewter, or later, ceramic plates which could be kept hot. Croup kettles and humidifiers were standard household equipment at a time when diphtheria was the haunting fear of parents of small children.

Pap boats (above) and spout cups (below). These shallow, sometimes half-lidded vessels were used during the eighteenth and nineteenth centuries in the feeding of infants and invalids and were made from a variety of material, both ceramic and metal. (Photo courtesy of The Pearson Museum.)

For the most part, saddlebag physicians did not concern themselves with normal pregnancies, which were generally left to local midwives. Reasons for this arrangement were multiple: lack of physician availability, belief in the immodesty of allowing "man-midwives" into so intimate a scene as childbirth, and the expense involved in employing a physician rather than a midwife. Actually, in many cases, experienced midwives were probably better obstetricians than the physicians who delivered only a few babies. Moreover, since these women did not go from obstetrical case to patients with infectious diseases and back again, the incidence of childbed fever in patients cared for by midwives was lower than with physicians. Dr. Oliver Wendell Holmes (1809-1894) was the first American physician to establish the fact that doctors often transmitted infections to "lying-in" women through their street clothes and unwashed hands.[10]

When serious problems arose in a delivery, however, an available doctor would be summoned. It is not surprising that many of the obstetrical instruments in medical museum collections are those for a version of a podalic case, the mutilation of a fetus after death *in utero* and its extraction from the womb, or for aid in the birth where the mother's pelvis was deformed. Doctors could carry all of these instruments with them.

Because the death of its mother put a nursling at a great disadvantage in sparse societies where wet nurses were not easily obtainable, families relied on many different methods of feeding babies, some of which included bottles, pap boats or lidded porringer dishes. As might be expected, domestic equipment for both the sick and well baby lasted longer than home-sickroom equipment for adults. A particularly ingenious invention was the glass baby bottle with a thermometer enclosed, an arrangement which attested to twentieth century use, when infant formulas were heated to a more-or-less precise temperature.

## MEDICAL SECTS

It is only fair to point out that many folk remedies and much of the therapeusis of other sectarians—faith healers, wise Indian chiefs and nature curers—were likely to be less heroic in their treatments than that of the orthodox physicians of the time and therefore probably did less harm. Homeopathic medicine, for example, which advocated minute doses of drugs, the study of the patient as a whole person, and the experimentation and statistical examination of results of therapeutic measures (the so-called "proving" of drugs), was probably as efficacious as the bleeding and purging

Homeopatic cases belonging to Dr. Harriet S. Taylor, M.D. Note the compact nature of these leather cases, perfect for protecting the delicate glass vials. (Photo courtesy of The Pearson Museum.)

sick individuals by regularly-trained doctors, since it allowed the "vis medactrix naturae" (the power of nature to heal) to take over and overcome the disease.

With the growth of other medical sects in the nineteenth century—such as osteopathy, chiropractic, or botanic medicine—practitioners of orthodox medicine were forced to examine their own premises against the claims of sectarians. This analysis often brought about an amalgamation of many theories and practices of orthodox practitioners with the sectarians, a situation in which presumably the best of each group could be used by all. In the United States this process began in the middle of the nineteenth century and is still evident today, where some of the sects (such as homeopathy) have been so incorporated into regular practice that they have ceased to exist in all but name. Others, such as Christian Science, have been accepted in part, while still others have been either discredited or rejected outright.

The main sects which have had a great impact on American medical practice are homeopathy, osteopathy, Christian Science, Mesmerism and phrenology. Minor groups also came and went during the nineteenth century, but generally had lesser influence. Sometimes these sects were founded by physicians (such as in the cases of homeopathy, osteopathy and phrenology), and might include some sound theories in their teachings; others were based on less logical foundations and gained no substantive foothold in standard medicine.

The popularity of homeopathy for Americans, especially many Midwesterners, is apparent from the large number of homeopathic medical schools in Illinois and Missouri in the late nineteenth and early twentieth centuries—wherever there was a large population of German immigrants. Started by a well-trained but generally unsuccessful German physician, Samuel Hahnemann (1755-1843), homeopathy was essentially a revolt against the harsh medications ordinarily prescribed at that time. It was based upon the theory that large doses of certain drugs given to a healthy person would produce symptoms that, when they occurred spontaneously as symptoms of a disease, were relieved by these same drugs in small doses. The homeopathic theory had two results: (a) a study of the characteristics of many drugs to learn their effect ("proving"); and (b) a diminution of both the number and size of drug dosages prescribed for patients. As already noted, homeopaths also taught that each person was unique and counselled physicians to study the whole patient.

Osteopathy, founded by Midwesterner A.T. Still (1828-1917), taught that the human body, when in correct alignment, is a vital machine capable of making its own remedies against infections and other toxic conditions. Osteopaths held that the function of the physician was to search for and remove any conditions which were factors in destroying the body's natural resistance. Manipulation of the skeleton was relied on heavily to bring about good health, but other therapeutic measures were not eschewed. Like homeopathy, osteopathy as it is practiced today is almost indistinguishable from the regular practice of medicine.

Some of the beliefs of Christian Science, first promulgated by Mary Baker Eddy (1821-1910) in Boston, are included in the tenets of modern medicine—particularly those of psychology and psychiatry. In the original system, which was essentially religious in nature, disease was considered a product of erroneous thought or beliefs: its cure required establishing a mental conviction of its non-material nature—that is, that disease was merely a figment of the imagination. Because of its hold on many people of the time, including a number of well-educated and wealthy individuals, regular physicians had to examine the tenets of Christian Science, and from this study came a greater understanding of the psychosomatic basis of some diseases which was incorporated into the regular practice of medicine.

Mesmerism, a system of therapeutics using "animal magnetism," later developed into hypnotism and therapeutic suggestion. Franz Anton Mesmer (1734-1815) of Vienna and Paris, believed that every living body possessed a magnetic fluid which gave out special forces which could then be transferred from one person to another. Mesmer used a large tub of weak sulfuric acid, from which emerged iron bars and cords to conduct the magnetic fluid to the patients who grasped them. It proved to be a very popular doctrine, with both Marie Antoinette and the Marquis de Lafayette as "patients" of Mesmer in Paris. Even Benjamin Franklin got into the discussion about the validity of Mesmerism when he was appointed a member of a special committee of the Paris Academy of Science to investigate Mesmer's claims. Later a spate of electrical devices were "invented," including one sold by Sears Roebuck and Co., to restore inadequate or unbalanced life forces.

Phrenology was a quasi-medical offshoot of Mesmerism on the one hand and the growing serious anatomical and physiological study of the nervous system on the other. Its history demonstrates how conclusions from real facts can be carried to extremes. The founder of the sect was Franz Joseph Gall (1758-1828), who spent many years studying the different areas of the brain to determine their

Phrenology heads illustrating the doctrine that separated mental faculties in man into precise areas of the brain. Plaster heads such as these made the marketing of this "science" easier. The lettered sections, depending somewhat on the "bumps" present, covered everything from color perception to "ideality." (Photo courtesy of The Pearson Museum.)

Engraving dating from the 1780s shows a drawing room gathering of Mesmer's disciples, with participants receiving therapy by placing various limbs under bands of iron in the communal tub. (Photo courtesy of National Library of Medicine.)

relationship to certain intellectual functions. Gall then went on to postulate that strength or weaknesses of the mental characters and the emotions of a particular individual could be determined by inspecting and palpating the exterior of the skull, noting especially the protuberances of the cranium. Thus the phrenologist could explain a patient's character from an analysis of that patient's head. Through Gall's assistant, Johann C. Spurzheim (1776-1832), who came to the United States to spread the doctrine, many Americans were "phrenalized"—including such notable figures as Abraham Lincoln and Walt Whitman.

In many laymen's minds faith healing (as in Christian Science), Mesmerism, brain localization studies (as in the scientific work of Gall), phrenology, and electricity all took on the same aura, with many not able to separate the reasonable and the logical from the absurd. Many charlatans took advantage of this confusion, producing pseudoscientific "electro-galvanic machines" which gave off sparks, lit colored lights, and made impressive noises, but did little to aid the physical ailments of their users.

## EXPLANATIONS OF DISEASE

Many systems of medicine promulgated to explain disease had as their basis a belief not in a generalized cause of disease—that is, one affecting the entire body—but in a specific anatomical derangement which either brought on the disease directly or indirectly by affecting other parts of the body. Beginning with the Greek physician Galen, who practiced in second-century Rome, the idea of disease as a disturbance of anatomical parts persisted through the centuries. Actually, there are many correlations between specific illnesses and derangements in such organs as the heart muscle, the liver, or the stomach. As a result, practitioners had long sought to examine as many dead bodies as possible to compare anatomical parts with the disease from which a patient had died. Dissection had become common in the eighteenth and early nineteenth centuries—just when colonial students were going to Europe for medical training. Collections of such cases were brought together, just as had been true of case histories in Greek hospitals. One of the most famous perhaps, was a three-volume work by Giovanni Battista Morgagni (1682-1771). Published in 1761, the volumes appeared under the auspicious title of *De sedibus et causis morborum per anatomen indignatis* (Concerning the Seats of Diseases as Shown by Dissections). There is an amusing story about the way in which Pennsylvania medical student John Morgan persuaded Morgagni to give him a copy under the assumption that their last names showed they must be related.

Hearing "trumpets" and conversation tubes reached full flower in design and decoration—particularly those made in England and the European countries—in the eighteenth and nineteenth centuries. (Photo courtesy of The Pearson Museum.)

As noted above, adherents to the humoral theory of disease causation tended to assume a disturbance within the body itself. In contrast, those championing the germ theory of disease actually were reverting to an older belief in the invasion of the body by an outside and nefarious force.

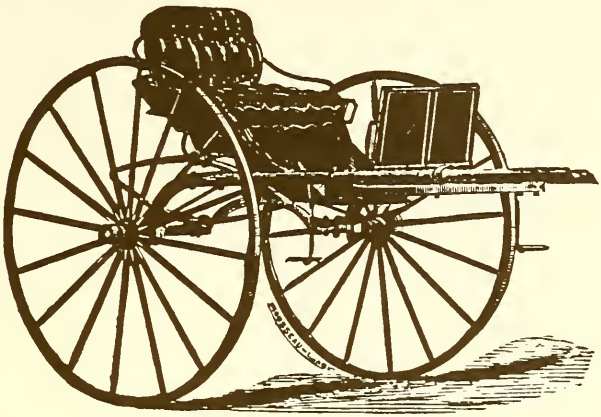
The advance of science depends in part upon the development of suitable instruments for collecting data and for manipulating situations. Thus, the germ theory of disease could not be put on any rational basis until microscopes came into common usage and the cause-and-effect relationship between the presence of particular strains of germs and certain diseases was understood.

The germ theory for determining the cause of disease was most clearly enunciated by Robert Koch (1843-1910), a German physician and early bacteriologist, who argued for the following rules if the cause of disease were to be established: a) the microorganism must be present in each case of the disease; b) one strain of bacteria must be isolated from another; c) innoculation of the germs under consideration must produce the disease in a test animal, and d) the same strain of germs must be recovered from the diseased animal. In the late nineteenth century, these rules—which constituted the so-called "Koch postulates"—were very successful in uncovering the basis for diseases such as diphtheria, cholera and typhoid fever. For a time the successes of laboratory science led many people to hope that disease might be eradicated entirely.

By the turn of the century, death rates in civilized countries had plummeted, physicians again became wonder-healers, and the prestige of laboratories and research scientists increased greatly. Consequently these changes had a definite impact on medical education, public health outlays of money, and the status of general practitioners.

The numerous changes in theory during the last century resulted in changes in practice. For example, the importance of statistical investigation of clinical therapeutic methods, first started by P.C.A. Louis (1781-1872) in France in the 1820s, made physicians aware of the need for good clinical records (as did also the economic interests of the newly burgeoning life insurance companies).[11] The discovery of bacteria in pathological specimens in the last half of the century encouraged development of equipment for the modern clinical and diagnostic laboratory. The use of anesthesia resulted in the design of equipment for delivering gases to the patient, as well as the necessary monitoring devices for its use. Along with these changes came discovery of various chemicals which could be

# DOCTORS, ATTENTION! PERFECTION AT LAST.



## A TWO-WHEELED VEHICLE

That will ride as easy as a four. Good and strong, with Phaeton body, good, full, large back—the rider can use and feel no more horse motion than in a four wheeled vehicle. Has all the conveniences for a doctor's box, for a chest storm apron, and as easy to get in and out of as a buggy; nothing to climb over in getting in. See below what the doctors say. I could furnish many more like them if I had the space:

"It is the best cart in our city." H. H. MALOCK, Ottawa, Ill.

W. R. CHURCH:—"I am satisfied there are none so near perfection as yours for ease and comfort to the country practitioner."
R. A. MCGLELLAND, M. D., Yorkville, Ill.

YORKVILLE, ILL., Dec. 12, 1882.

"I have been using one of Church's Physicians' Road Carts for some time and am well pleased with it. I have practiced medicine for nearly twenty-five years, and have used almost every kind of vehicle on two wheels that I have ever seen, but this is the only conveyance of that description that I have ever used that I can heartily recommend. W. T. SHERWOOD, M. D.

PLANO, Dec. 8, 1882.

W. R. CHURCH—Dear Sir: "The Road Cart I purchased of you is all and more than you told me. It rides as easy as any four-wheeled buggy, and I most heartily recommend it." Yours truly, O. P. BLATCHLY, M. D.

W. R. CHURCH, Yorkville, Ill.—Dear Sir: I have used one of your Road Carts since last February. I think it superior to any Road Cart I have examined. It is THE thing for the "busy" practitioner. Yours Respt., W. E. KINNETT, M. D.

JACKSONVILLE, Ill., March 28, 1883.

W. R. CHURCH, Yorkville, Ill.—Dear Sir: I am greatly pleased with your two-wheeled vehicle. I have no more use for four-wheeled buggies in my business. It discounts anything of the kind that I have ever seen. A. W. TIPTON, M. D.

Write for prices and circulars. Address the Manufacturer,

**W. R. CHURCH, Yorkville, Illinois.**

☞ **Special Facilities for Shipping.**

Advertisement for a two-wheeled doctor's cart, which appeared in the first volume of the *Medical Herald* in 1883. (Photo courtesy of National Library of Medicine.)

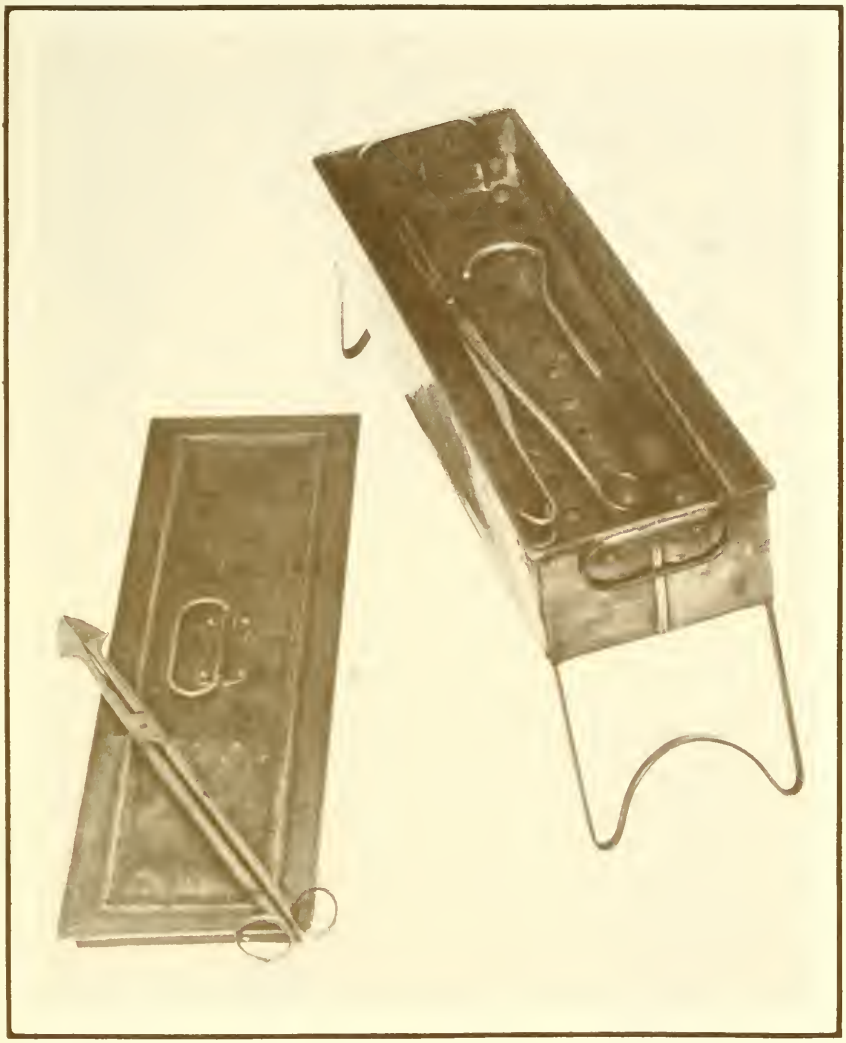
substituted for the more traditional ether or chloroform. The physician's office demonstrated the extent to which asepsis and antisepsis figured in sterilizing instruments.

With the modernization of such techniques and instrumentation, the place in which diagnostic and therapeutic measures were offered became the physician's office or the hospital, rather than the patient's home. As the prairie became more settled and roads more passable, patients could come to the physician's office, where a large number of diagnostic and therapeutic devices were assembled, could be operated upon in a hospital, and could receive prescribed medicine from the druggist at the corner drug store. John Morgan's proposal in the 1760s to develop a system which distinguished the physician from the surgeon and the pharmacist was finally taking shape on the former frontiers of America 125 years later. Some patients came to the physician's office for diagnosis and treatment, while at the same time their physician went to the patient's home when the latter was ill enough to be confined to bed. Only since World War II has the tendency for physicians not to make house calls been widespread throughout the country. With widespread clinic and hospital out-patient attendance, there has arisen a dissociation of the individual physician from the individual patient—a fact which has had important consequences in the layperson's view of the medical profession.

## SITES OF PRIMARY MEDICAL CARE CHANGES

Between 1880 and 1920 the center of medical practice in the United States moved from the patient's home to the general hospital.[12] The home ceased to be the normal place for birth, serious illness and death as the family yielded medical care to specialists. The reasons for this change are numerous.

Early American physicians had practiced medicine primarily in the homes of their patients, with the family (or its surrogate, servants or innkeepers) acting as nurses and housekeepers. Improvements in road networks, the growing importance of boarding houses and hotels for immigrants without families, the newer knowledge of control of infections (which allowed patients to have a better chance of coming out of hospitals alive and well), and better equipment with which to practice, all conspired to change the place of medical care delivery. As middle-class citizens began to use hospitals, there was more of a demand for better facilities than had been offered to the charity patients of earlier times, and many institutions added "private pavilions" for their more wealthy



Copper sterilization tray used in the later decades of the nineteenth century for the boiling of instruments. (Photo courtesy of The Pearson Museum.)

Early surgical suite in hospital. (Photo courtesy of Memorial Medical Center, from the files of the School of Nursing Alumni Association.)

Early hospital room with furniture common to households of the time. (Photo courtesy of Memorial Medical Center, Springfield, Illinois.)

clientele. As more and more physicians accepted the germ theory of disease causation, they became less moralistic and more scientific, an advance which encouraged the use of more technical equipment. Even the growing labor movement had a hand in these changes, particularly in cities with large populations of working men and women and strong political bosses who came from the working class. These individuals demanded better treatment and more dignity for patients than upper-class physicians were accustomed to giving to lower-class ward patients.

When community hospitals became widespread in the United States, the physicians who ran them needed help in their administration. As a result, they often employed various kinds of assistants—from nurses and orderlies to administrative assistants such as accountants and secretaries, to supportive staffs such as buildings and grounds men, maintenance workers, cooks, laundry staff, and others. Often a retired physician was appointed superintendent of the whole operation, under the rules and policies laid down by the boards. For all practical purposes, until the end of the nineteenth century, the physician was the effective head of all of the work of the hospital, with lay members on the board mostly for financial help.

A change in governance of the American hospital came about in part because of the growth of specialization in medical care, and in part because of the growth of medical technology. This change had both bad and good consequences. Although it drew physicians away from the intimate relationship with their patients and the small details of their problems, it provided greater ability for physicians to change the course of disease by prevention or treatment.

Central to all of these changes, however, was the need to bring patients into contact with modern equipment available for use by doctors, nurses and therapists. No longer was it possible for physicians to carry in saddlebags—or even on the back of Model T Fords—all the necessary instruments and supplies to perform diagnostic tests which require a well-stocked clinical laboratory. Surgical theatres with equipment for specialized anesthetics and related monitoring, various kinds of x-rays, electrocardiographs, oxygen cylinders, blood transfusions, kidney dialysis machines, CAT scanners, intravenous infusions, and a whole range of more sophisticated equipment became prominent.

A corollary of the increased use of technological equipment is the need for technicians specially trained in equipment operation and interpretation of results. Although the complaint that more and more physicians were becoming specialists had been heard in the

United States as early as 1845, it was still only a moot point until after the Civil War. Before medical specialization can flourish, a certain mass of people must be living close together. Even today there are more medical specialists in cities such as New York, Chicago, or Los Angeles than there are in communities such as Bozeman, Montana or Clovis, New Mexico. In addition to a threshold of population large enough to provide sufficient cases for honing technical skills and providing reasonable economic returns for the effort, there must be a clear body of knowledge which a specialist can master over that attainable by a generalist.

The move of medical care from the home to the hospital took place in America around World War I, grew to ever-larger proportions during the Depression, and exploded after World War II. It was during this latter period that the medical equipment, surgical skills, and specialization of the medical corps in combat returned to civilian life. Suddenly not only were physicians specialized, but so were para-medical groups. Medics became physicians' assistants; nurses became surgical nurses, psychiatric nurses, pediatric nurse practitioners, and a host of others. Intensive care personnel, pulmonary technicians, computer lab assistants, and oncology radiation specialists all became recognized as healers. Often better trained in the use of the new equipment than physicians, they became indispensable; the hospital itself became the microcosm of the entire biomedical world. Because they were indispensable, nurses and allied health personnel brought with them the pull of the economic world outside, including demands for more status, more pay, and a hand in the decision making of the group. Labor-relations became a problem everywhere.

With the increase in number of specialized healers, the relationship between physician and patient also underwent a change. The unique ties which had existed between the two from time immemorial began to be lost as a host of intermediaries came between physician and patient. The loss of confidentiality, personal warmth and loving care from a person admired led to all kinds of problems, including a dislike and distrust of healers and the health care delivery system in general.

Yet the dilemma for the physicians is that the need to employ all the paraphernalia of biomedicine for the good of the patient requires the interposition of others into the one-on-one situation which existed in earlier times. Saddlebag physicians practiced a very personalized medicine. Physicians who saw patients in earlier hospitals and clinics had lost some of that ability, while those who attend patients in modern medical centers are hard-put to match Sir William Osler's (1849-1919) imperative to "know the patient."

Daybook of Dr. Charles Chandler has entries dating to 1838. (Photo courtesy of The Pearson Museum.)

What of the future? The latest efforts to monitor men in space have resulted in designing devices for collecting and transmittng biomedical information about individuals over long distances. No longer is it even necessary for physicians to see their patients face-to-face in order to deliver centralized medical diagnosis or care. How will these changes affect the practice of medicine? Will there be a further loss in the personal qualities of the physician-patient relationship? If so, what societal effects not yet envisioned—such as the way increases in medical malpractice suits were not foreseen—will result?

Medical care in the United States started out under conditions which reflected the new and unsettled country in which it was taking place. However, such care also mirrored the prevailing views of health and disease and the technology available for treatment. As each part of the situation changed, health care delivery also changed to meet the new situation. There is no reason to believe that the future will be different in this respect.

The nineteenth century brought a proliferation of "home" inhalation devices—vaporizers, inhalers and atomizers advertised as remedies for whooping cough, asthma, colds, diptheria and a host of other human ailments. (Photo courtesy of The Pearson Museum.)

## CHART OF THE HUMORS

| PRIME MATTER | QUALITIES | HUMOR | ORGAN | TEMPERAMENT | SEASON |
|---|---|---|---|---|---|
| Fire | Hot & Dry | Yellow bile | Liver | Biliois or Choleric | Summer |
| Air | Hot & Moist | Blood | Heart & Lungs | Sanguineous | Spring |
| Earth | Cold & Dry | Black bile | Spleen | Melancholic | Autumn |
| Water | Cold & Moist | Phlegm | Brain, Lung & Kidneys | Phlegmatic or Lymphatic | Winter |

Facsimile of an eighteenth-century humors chart, used by early practitioners as a guide in determining correct proportions of bodily humors. Humoral theory was the basis for belief in regular, preventive bloodletting.

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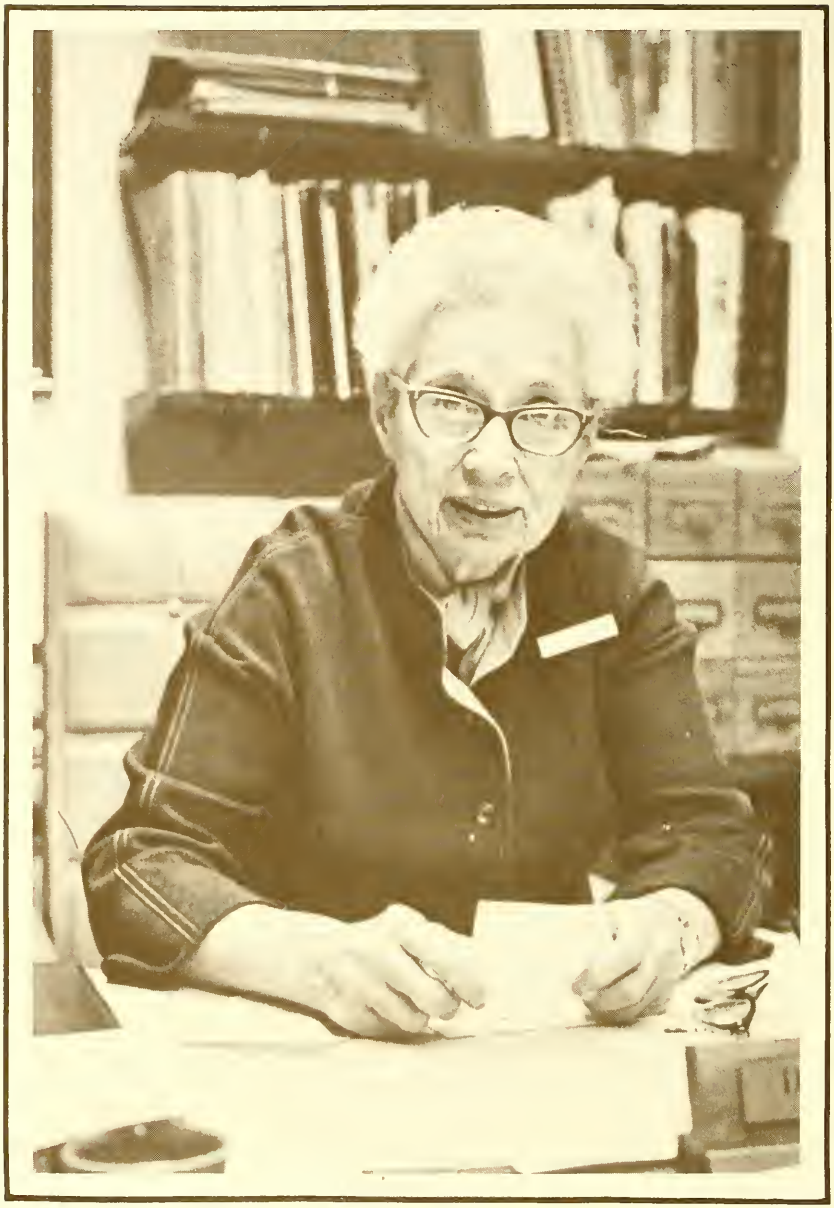


Dr. Estelle Brodman. (Photo courtesy of Washington University Medical Library Archives.)

# FROM THE EDITOR

Few persons in the health sciences have as far reaching and enduring an influence on their specialties as Estelle Brodman. As Professor and Librarian at Washington University School of Medicine for nearly twenty years, she provided with example as well as advice for countless numbers of us the attributes of the humane, creative and competent scholar.

Dr. Brodman earned her bachelor of arts degree in histology and embryology from Cornell University, and both bachelor and master of science degrees in librarianship from Columbia University. After gaining some experience in librarianship, she pursued work for the doctorate and received her Ph.D. degree from Columbia in 1953 with a concentration in the history of medicine.

Dr. Brodman has extensive publications, including two books and over sixty essays. She has been a consultant for health science libraries, archives and museums throughout the United States, including membership on the President's National Advisory Commission on Libraries for 1966-68 and the Library Guidelines Committee for the American Association of Medical Colleges, 1963-64. In addition she has served as a consultant for the World Health Organization in India and South East Asia and as a Rockefeller Foundation Fellow and Visiting Professor at Keio University, Japan.

For her many contributions to the health sciences, Dr. Brodman has received numerous awards, including the Marcia C. Noyes Award for Distinguished Librarianship from the Medical Library Association (1971), an honorary D.Sc. degree from the University of Illinois (1974), the Gottlieb Award for Medical History from the Medical Library Association (1977) and the John Cotton Dana Award of the Special Library Association (1981). Upon her retirement from Washington University in 1981 an endowed lectureship was established in her name. Her scholarly papers and professional correspondence have been donated to the library of Columbia University.

It is a special privilege for me to be able to recognize Dr. Brodman in this issue of *Caduceus*. Her years as senior consultant to The Pearson Museum, The Special Library Collection and The Department of Medical Humanities of Southern Illinois University School of Medicine were as formative as her guidance was gracious.

*—Glen W. Davidson*

# MEDICINE THROUGH THE LENS OF THE MUSEUM

By Audrey B. Davis, Ph.D.

Historical medical exhibitions in public museums offer the opportunity to explore the dynamics of human relationships within a social and cultural setting. Have medical exhibits achieved this purpose? Items displayed in a medical exhibit open to the public commonly comprise historical hardware—instruments, devices, clothes and furniture used by doctors, dentists and technicians and a smattering of nursing implements. Anatomical remains may also be included and are featured in a few museums which were formed for the purpose of exhibiting these preserved specimens for study by medical students and professionals. Some of these collections, most notably the Armed Forces Institute of Pathology and the Muetter Museum in the College of Physicians of Philadelphia, are the finest in the U.S. They provide all visitors with a better understanding of the human body.

Labels for instruments and devices provide the name and date of the invention and the inventor, its purpose and function, and the significance of the therapies assisted through the invention. These descriptive labels rarely analyze the instrument, the treatment it provided or the impact it had on human life. The aim of these exhibits is to depict the development of diagnostic and therapeutic procedures. As it is generally assumed that the "public" will not understand the intricacies of medical technology and practice, nor be interested in the technical or professional aspects of scientific medicine, complex and "unnecessary" details are not included. Is this patronizing attitude proper and useful? Has this assumption precluded the exhibition of items and concepts which would reveal a better understanding of the history and development of medicine?

A strong motive for the arrangement of medical exhibits has been the desire to promote the view that medicine developed from a primitive, non-scientific craft to a precise, scientific-technological practice of great effectiveness. In part this focus stems from a need to reassure visitors that modern medical diagnoses and treatment are accurate, reliable and successful. Since many exhibits are suggested, supported and promoted by medical practitioners, who believe that western (American) medicine has improved steadily, this progressive view of medical history is often adopted in the exhibit. Those items which document medical advances are displayed.[1]

Medical exhibit organizers have not relied sufficiently on the knowledge and interpretations of historians in the planning and mounting of historical medical exhibits. In fact there has been little concerted effort to delineate the historical development from current medical goals and practices in historical medical museum exhibits. The availability of objects for display and the expectation among the medical community that leading practitioners, inventors and theorists be represented in medical exhibits have placed major constraints on medical museum curators with a historical focus. Historians and medical professionals do not always share congruent historical viewpoints.

Let me illustrate some of the difficulties of presenting an historically accurate and sensitive medical exhibit with an example from my own experience. The exhibition at the National Museum of American History entitled "Pain and its Relief," which opened in October of 1983, was planned to present a conceptual medical theme, the most elemental one stemming from disease and bodily harm, the experience of pain in its multiple forms and the introduction of theoretically and empirically based drugs and equipment to alleviate pain. The considerable expense of mounting the exhibit was borne by the American Society of Anesthesiologists. The ASA anticipated a major "permanent" exhibit depicting the discovery of anesthesia in the U.S. and revealing the highlights of the many steps taken to understand and improve the delivery of anesthesia to patients since the introduction of nitrous oxide and ether to eliminate the pain of dentistry and surgery in 1842 and 1846. The exhibition has succeeded in informing many visitors about the history and treatment of pain. The ASA is satisfied.

The core of the exhibit is the nineteenth-century discovery of anesthesia by Horace Wells, William Morton and Crawford Long. Their contributions are richly documented.

The introduction to the exhibit contains the artifacts, instruments and symbols used in coping with pain in a variety of cultures. Without anesthesia or the assistance of the medical profession or the use of drugs and procedures not employed by current medical practitioners, many people continue to treat their pain themselves. These responses to pain entail a different set of goals and techniques than the delivery of anesthetics during a medical or surgical procedure. Modern anesthesiologists do not accept or cannot explain some of these techniques and are not always interested in pain incurred outside the operating room. Therefore, discussion ensued between representatives of the ASA and myself over the rationale and value of including other pain relief techniques not related to surgery in this exhibit.

Anesthesiologists, frustrated in their attempts to explain the function of anesthetics to their patients satisfactorily, were reluctant to exhibit any items that might distract the public from understanding the latest anesthetic drugs and techniques administered in hospitals. Anesthesiologists have minimal access to surgical patients, who are more concerned about their diseases and the operations they are to undergo than the anesthetics they will receive. In general patients see very little of the functions and procedures of their anesthesiologists, a fact which led to the profession's interest in a major public exhibit to explain their important role in the operating room.

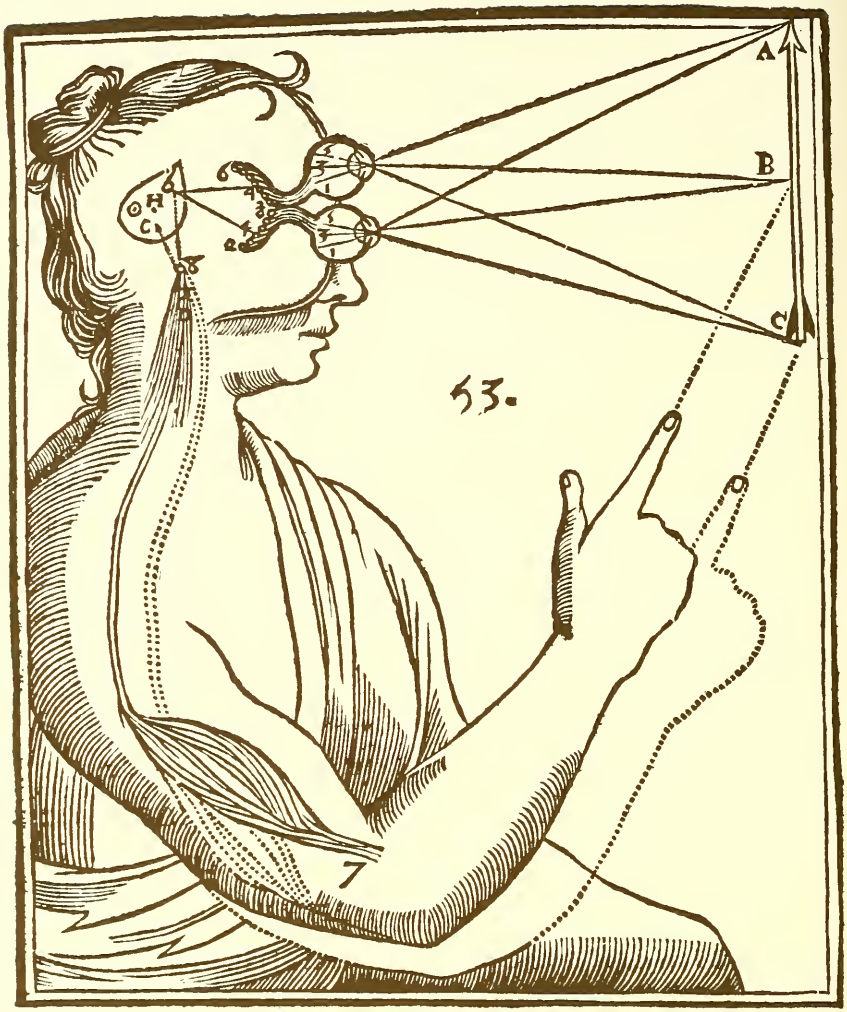
Another reality which influenced the scope of the exhibit is the image of the anesthesiologist relative to other medical and surgical specialities, in addition to personal satisfaction and greater income. Recruitment of the best medical students is enhanced by the specialty's reputation. The better graduates in turn provide anesthetics safely to their patients, discover better anesthetics and teach future students.

An additional complication for anesthesiologists is the fact that at least half the professionals who administer anesthetics in the United States are nurse anesthetists and not medical doctors. By virtue of their education, nurse anesthetists are considered less qualified to administer anesthesia, although their record for delivering anesthesia safely is excellent. Physician anesthesiologists argue that all anesthesia should be given under their supervision, even if applied by nurse anesthetists. In the pain exhibit the history of the nurse anesthetist was depicted in only one early photograph of a few nurse anesthetists in a hospital because the ASA objected to inclusion of this chapter of American pain control by a rival professional group.

In view of these realities, many anesthesiologists believed that to inform the public about other pain control methods would not accomplish their goal of improving their reputation and might lead to further confusion. The integrity of the pain exhibit as a historical document was skewed in favor of public education for the purpose of teaching and emphasizing current practices, and in addition, for enhancing the positive image of modern physician anesthesiologists. The major display which depicts the image anesthesiologists would like to convey is the modern operating room in the center of the exhibit. In the midst of a richly supplied technological environment, there are mannikins representing the anesthesiologist and nurse, but not the surgeon. The anesthesia team dominates the O.R.—even if only in an exhibit.

Although my example focused on anesthesiology, other medical specialities would reveal similar attitudes which the historian curator and the practitioner would find difficult to reconcile in a public exhibition. The public image of the modern physician is not unimportant. Image should not be dismissed as a selfish, wholly economically inspired phenomenon. My point is not to insist on an historical exposé of the foibles and seemingly selfish interests of professionals, but to aim for a more honest and balanced approach to medicine by recognizing the myriad roles, functions and needs of the profession. Medical professionals live within an environment dominated by technology, however they perform their duties for people. Both the technological and human aspects of the medical enterprise should be represented in the public forum of exhibits. This is not an easy assignment, but it should be attempted. One circumstance which would assist the historian curator to be intellectually free would be to receive funds from neutral sources such as local, state and federal government grants as well as private non-medical sources.

1 Exhibitions of this type are discussed in a paper the author delivered at the College of Physicians of Philadelphia as the Kate Hurd Mead Lecturer, on March 14, 1985. This lecture will be published in full in the *Transactions of the College of Physicians of Philadelphia* under the title, "Medicine Through the Lens of the Museum." Dr. Davis is Curator of Medical Sciences Division, National Museum of American History, Washington, D.C.




Woodcut illustration of binocular vision from Rene´ Descartes' *L 'homme,* Paris, 1677. (Photo courtesy of Washington University School of Medicine Library.)

# THE BERNARD BECKER, M.D. COLLECTION IN OPHTHALMOLOGY

By Christopher Hoolihan

In 1950, having just finished his training at Johns Hopkins, a young ophthalmologist attended the International Congress of Ophthalmology in London, the first stop on a six-month sojourn in Europe that would include fellowships in Copenhagen and Upsala and visits to England, Scotland and France as well. The young ophthalmologist was Bernard Becker, and so impressed was he by the bookshops he saw in post-war Europe that he spent nearly all his spare time visiting them. Six months later, when he returned from Europe on the Queen Mary, Becker had to purchase an extra trunk to hold the hundred or more volumes he had acquired in the course of his journeys.

The contents of this trunk formed the core of what is considered one of the finest collections of rare ophthalmological books in the world. Presented to the Washington University School of Medicine Library in 1975, the Bernard Becker, M.D. Collection in Ophthalmology presently consists of approximately 500 titles in ophthalmology and optics published between 1496 and 1900.

Perhaps the best way to begin a description of this unique collection is with a brief statistical profile, reflective not only of its contents but of the progress of ophthalmology over the course of five hundred years of printed literature. Books published in the sixteenth century make up 4 percent of the collection; those published in the seventeenth century, 12 percent; eighteenth-century books comprise 29 percent of the collection; books published between 1801 and 1850 make up the largest proportion, 30 percent; and books published from 1851 (the publication date of Helmholtz's description of the ophthalmoscope)[1] to 1900 account for 25 percent of the titles in the collection.

By place of publication, books published in England account for the largest group in the collection, 22 percent; followed by French imprints, 21 percent; and German imprints, 19 percent. Books published in Austro-Hungary make up less than 8 percent of the collection, but it is interesting to note that 69 percent of these titles were published after 1801, reflecting the importance of the Viennese school in the progress of nineteenth-century ophthalmology. In Italy the opposite is true. Italian imprints make

up almost 10 percent of the collection, 90 percent of which were published before 1800. This observation reflects the decline of such cities as Padua, Bologna and Milan as centers of medical research and study after the eighteenth century.

Three sixteenth-century works in the collection are representative of the state of ophthalmology in the late Renaissance. The first work in the English language devoted exclusively to ophthalmology was Walter Bailey's *A Briefe Treatise Touching on the Preservation of the Eie Sight,* published at London in 1586. An octavo volume of only twenty-three pages, the *Briefe Treatise* is a continuation of medieval traditions in ophthalmic practice drawn largely from Arabic sources.

A work many historians regard as the finest ophthalmological treatise of the Renaissance is French surgeon Jacques Guillemeau's *Traite des maladies de l'oeil,* published in Paris in 1585. In this work Guillemeau combined two of the most important influences on Renaissance medical progress: the personal observations and practical experiences of the non-university trained surgeon, and the Graeco-Roman medical tradition which continued to dominate European medical thinking through the end of the sixteenth century.

One of the most remarkable and certainly the best known ophthalmological book of the sixteenth century is Georg Bartisch's *Augendienst,* published in Dresden in 1583. Written in the vernacular, the *Augendienst* is regarded as the first modern work on the surgery of the eye. Its ninety-one woodcut illustrations, based upon Bartisch's original drawings, comprise a comprehensive graphic representation of Renaissance eye surgery.

Early in the history of modern ophthalmology, however, books became less important as the products of individual genius than as the products of the schools in which individuals worked. In fact, the Becker Collection may perhaps be best considered from the point of view of national schools (or traditions) in ophthalmology. In the understanding of cataract and the practice of ocular surgery, for instance, little elaboration is needed on the contributions of French surgeons in the eighteenth century. French imprints make up 21 percent of the Becker Collection, and of this percentage, most are from this period.

One of the earliest such contributions was Michel Brisseau's *Traite de la cataracte et du glaucoma* (Paris, 1709), the first published description of the true nature and location of cataract. Clearly distinguishing glaucoma from cataract, Brisseau was also the first

Woodcut illustration of cataract depression from Georg Bartisch's *Augendienst,* Dresden, 1583. (Photo courtesy of Washington University School of Medicine Library.)

to describe glaucoma as a disease of the vitreous humor and not of the lens. A name closely associated with Brisseau regarding the opacity of the lens in cataract is Antoine Maitre-Jan, whose massive quarto *Traite des maladies de l'oeil et des remedes propres pour leur guerison* (Troyes, 1707) is regarded by many as the finest ophthalmic treatise of the period.

Charles de Saint-Yves' only published work, his *Nouveau traite des maladies des yeux* (Paris, 1722), describes several innovations in ocular surgery, among them the record of his removal *en masse* of a dislodged cataract that had been forced into the anterior chamber during an unsuccessful attempt at depression.

The most important contribution to ocular therapeutics during the eighteenth century was Jacques Daviel's account of his operative treatment of cataract by extraction of the lens, published in the second volume of the *Memoires de l'Academie Royale de Chirurgie* in 1743 (II:337-352). French contributions in ophthalmology continued to be impressive, especially with the publication of Guillaume Pellier de Quengsy's *Precis ou cours d'operations sur la chirurgie des yeux,* a two-volume set which appeared between 1789 and 1790. Quengsy's massive work, illustrated with thirty-four engraved plates, was to become a classic in ocular surgery.

Georg Joseph Beer is regarded as the founder of the Viennese school in ophthalmology. Four of his works are in the collection, including his two-volume *Lehre von Augenkrankheiten* (Vienna, 1813-17), a work which dominated ophthalmic practice for an entire generation. Perhaps the greatest figure in the tradition established by Beer was Ferdinand Arlt, whose epoch-making *Die Krankheiten des Auges* (Vienna, 1855-56) went through three editions in two years, a remarkable publishing phenomenon for the period.

Six of Eduard Jaeger's works are in the collection, including his monumental ophthalmoscopical atlases; and an equal number of the works of Karl Stellwag von Carion, a member of the Viennese school whose work has never been adequately appreciated by English-speaking historians.

Forty-one percent of the British imprints in the Becker Collection were published between 1801 and 1850, a fact which is reflective of the emergence of British ophthalmology in the first half of the nineteenth century, after its rather suspect status in the preceding century. In 1807 in London, John Vetch published *An Account of the Ophthalmia Which Has Appeared in England Since the Return of the British Army from Egypt,* the first description of the "Egyptian

AN

# ACCOUNT

OF THE

# OPHTHALMIA

WHICH HAS

APPEARED IN ENGLAND SINCE THE RETURN OF THE

## *BRITISH ARMY FROM EGYPT.*

By JOHN VETCH, M. D.

MEMBER OF THE MEDICAL SOCIETY OF EDINBURGH, AND
ASSISTANT SURGEON TO THE 54TH FOOT.

Nonne vides etiam cæli novitate et aquarum,
Tentari, procul à patriâ quicunque domoque
Adveniunt? Ideo quia longè discrepat aer
Nam quid Britannum cælum differe putamus
Et quod in Egypto st qua mundi claudicat axis?
LUCRETIUS, Lib. Sept. 1101.

*LONDON:*

PRINTED FOR LONGMAN, HURST, REES AND ORME,
PATERNOSTER ROW;
By C. Stower, Paternoster Row.

1807.

Title page to John Vetch's work on trachoma. (Photo courtesy of Washington University School of Medicine Library.)

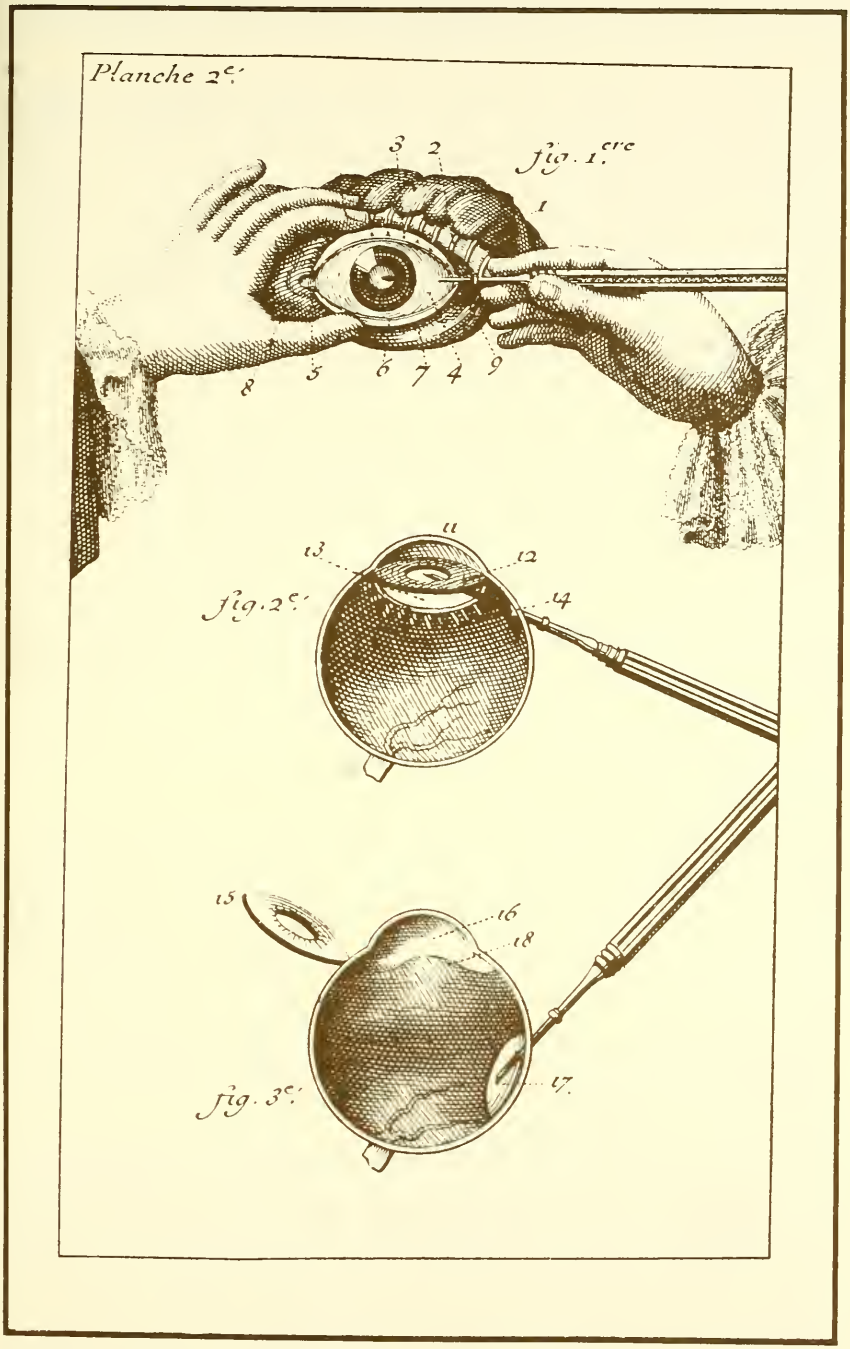
ophthalmia," subsequently named *trachoma.*[2] In the following year, the first volume of James Wardrop's two-volume *Essays on the Morbid Anatomy of the Human Eye* was published (London, 1808-18), illustrated with fifteen splendidly engraved and carefully hand-colored plates. These particular essays were directly influenced by Bichat's pathological anatomy and hence are a landmark in the topographical description of ocular disease.

Benjamin Traver's *A Synopsis of the Diseases of the Eye,* published in London in 1820, is regarded as the first systematic treatise in English on diseases of the eye. It was followed ten years later by one of the most successful English language textbooks of ophthalmology, William Mackenzie's *A Practical Treatise on the Disease of the Eye* (London, 1830), probably the first publication to draw attention to increased intra-ocular pressure as characteristic of glaucoma. *The Anatomy of the Human Eye* (London, 1834) by John Dalrymple was, oddly enough, the first book in the English language devoted exclusively to ocular anatomy. It may also have the distinction of being the first English-language ophthalmic text to be illustrated with lithographs.

Dalrymple's second major work provides a good opportunity to once again change the focus on the collection, from the works of individual members of national schools to works within a certain class of books—the next category—atlases of the diseases of the eye.

One of the most ambitious atlases of ophthalmic pathology after the publication of Bichat's *Traite des membranes* (1800)—and certainly the grandest such effort before the introduction of lithography in book illustration—was the large quarto atlas which accompanied Antoine Demour's three-volume *Traite des maladies des yeux* (Paris, 1818). In the first quarter of the nineteenth century, no mechanical process had yet been perfected for printing in color with the kind of local chromatic accuracy essential for depicting pathological conditions. Such illustrations had to be colored by hand, an obviously time consuming and expensive process. Fifty of the sixty-five plates in Demours' atlas are hand-colored.

An even more startling example is Friedrich August von Ammon's *Klinische Darstellungen der Krankheiten des menschlichen Auges,* regarded by many as the best summary of the knowledge of eye diseases prior to the introduction of the ophthalmoscope. Issued in four parts between 1838 and 1847, Ammon's atlas is illustrated with fifty-five engraved plates, each of which is more than forty centimeters in height and each of which had to be colored by hand in order to achieve proper chromatic accuracy in its hundreds of




Engraved illustration of the operation for cataract depression from Michel Brisseau's *Traite de la cataracte et du glaucoma,* Paris, 1709. (Photo courtesy of Washington University School of Medicine.)

views of pathological conditions. Supposing that this atlas was issued in an edition of 1,000 copies, the extent of work required for its coloration seems almost incredible.

This kind of chromatic refinement remained a problem for color printers to one degree or another for the remainder of the century. Even after the development and practical application of color lithography in the late 1830s, the problem persisted. John Dalrymple's *magnum opus,* his *Pathology of the Human Eye* (London, 1852), is illustrated with thirty-eight chromolithographs, each of which, however, had to be touched up with additional pigments by hand to indicate more accurately the local chromatic changes that even by the middle of the nineteenth-century color printing was still unable to achieve.

Two major developments combined in the mid-nineteenth century to completely alter the nature of ophthalmic atlases. The first was Helmholtz's description of the ophthalmoscope in 1851, and the second, the gradual improvements in chromolithographic printing techniques. Probably the best known nineteenth-century ophthalmoscopic atlas is Richard Liebreich's 1863 *Atlas der Ophthalmoscopie.* An earlier and technically superior atlas in the Becker Collection is Eduard Jaeger's *Beitrage zur Pathologic des Auges,* a collection of seventy-seven outstanding chromolithographic plates issued in parts at Vienna between 1855 and 1870.

Considering lithography's obvious practical and economic advantages and its nearly universal use in the more than a hundred ophthalmoscopic works which appeared in the latter half of the nineteenth century, it is rather difficult to explain the anachronistic magnificence of the hand-colored engraved plates which illustrate Christian Ruete's *Bildliche Darstellung der Krankheiten des menschlichen Auges,* published in Leipzig between 1854 and 1860. Seven of its thirty-nine folio-size plates provide hand-colored ophthalmoloscopic views of the fundus.

Photography also made its appearance in pathological atlases of the late nineteenth century, but its impact must not be exaggerated. Color photography was still in its nascent stages and micro-photography had nowhere near the prominence of other graphic media in the illustration of histological texts. Despite the appearance of "autotype" views of the fundus in W.R. Gower's *A Manual and Atlas of Medical Ophthalmoscopy* (London, 1879), photography was employed best in the depiction of external pathologic conditions. One of the finest such examples in the Becker Collection is Andrew Maitland Ramsay's *Atlas of External*

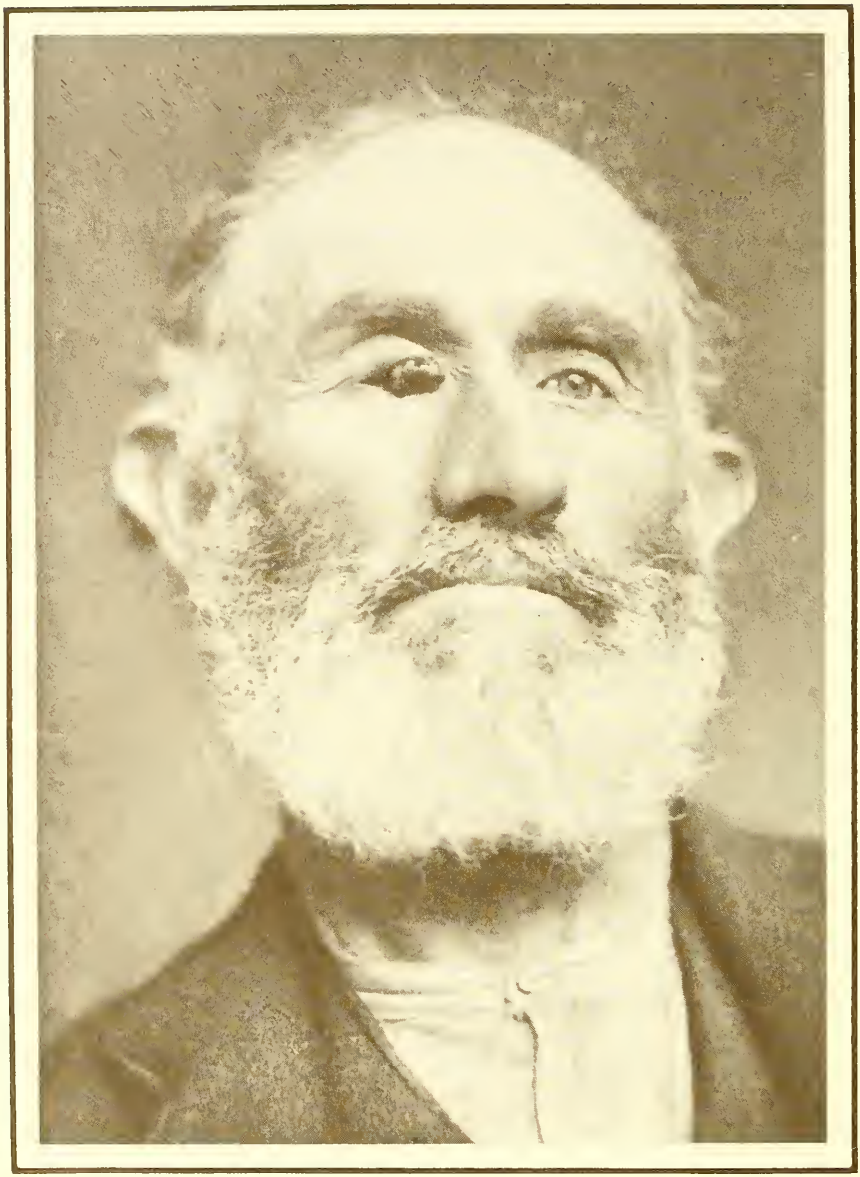
*Diseases of the Eye* (Glasgow, 1898), illustrated with eighteen photogravures (and thirty chromolithographs).

Physical and physiological optics make up an important part of the Becker Collection. Like many other possible approaches in describing the collection; its richness precludes any extensive narration. An all too brief cross section from this part of the collection includes the 1572 Basel edition of Alhazen's *Opticae thesaurus,* the foundation of western optical science after its translation into Latin in the twelfth century; *La prospettiva di Euclide* (Florence, 1573); the first vernacular edition of Euclid's *Optics,* which includes the first printed version of the *Capita opticorum* of Heliodorus of Larissa; Francois d'Aguilon's *Opticorum libri sex* (Antwerp, 1613), each of whose sections is headed with an engraved vignette by Peter Paul Rubens (one of only seven books known to have been illustrated by the Flemish artist); the magnificently illustrated *Ars magna lucis et umbrae* (Rome, 1646) of Athanasius Kircher, one of the most remarkable intellectual figures of the seventeenth century; Francesco Maria Grimaldi's *Physico-mathesis de lumine, coloribus, et iride* (Bologna, 1665), the first scientific attempt to establish a wave theory of light; and the detailed physiology of vision contained in the 1677 French translation of Rene Descartes' *Tractatus de homine.*

Sir Isaac Newton dominates the transition into the eighteenth century with his *Opticks* (London, 1704), the first full presentation of a corpuscular or emission theory of light; and his *Optical Lectures,* published in London in 1728. The next century is dominated by the monumental contributions to physiological optics of Franciscus Cornelis Donders[3] and Hermann Helmholtz, whose *Handbuch der physiologische Optik* (Leipzig, 1867) may well have been the most important nineteenth-century work on the subject.

There are numerous additional important works in the collection that have escaped notice—major works, such as Johann Gottfried Zinn's *Descriptio anatomica oculi humani* (Gottingen, 1755), the first complete work on ocular anatomy; or Antonio Scarpa's *Saggio di osservazioni e d'esperienze sulle principale malattie degli occhi* (Pavia, 1801), illustrated with engravings after Scarpa's own drawings; or the *Icones oculi humani* (Frankfurt, 1804) of Samuel Thomas von Soemmerring, quite possibly his finest work.

No portrait of a collection would be complete without a representation of its lesser works—the minor but nonetheless significant books which round out a truly great collection. The popularizations of Newtonian optics by Francesco Algarotti[4] and François Voltaire[5] certainly fall within this category. Joseph Jacob



Photogravure of exophthalmic goiter from Andrew Maitland Ramsay's *Atlas of External Diseases of the Eye,* New York, 1898. (Photo courtesy of Washington University School of Medicine Library.

Plenks' *Doctrina de morbis oculorum,* published in Vienna in 1777, is in the collection, as well as the Japanese translation of this work printed at Osaka in 1815-16, making it the first western ophthalmological book available in Japan. Also of interest is George Wilson's *Researches on colour-blindness* (Edinburgh, 1855), the first monograph on color-blindness and the first publication in which an author called attention to the hazards of red-green color blindness in ships' pilots and railway engineers.

Dr. Becker presented his collection to the Washington University School of Medicine Library in order to make available generally books he personally had enjoyed for so many years. Since its presentation to the medical library in 1975, the Becker Collection has continued to grow—both through Dr. Becker's own on-going interest and generosity and through additions made to the collection by medical library staff. In fact, more than a hundred and twenty titles have been added to the collection since 1975.

For students of the history of ophthalmology, the history of the book, the history of medical book publishing or book illustration, the Becker Collection is an invaluable and in some aspects unique resource. It is the hope of all those concerned with the collection's care and development that it will become the object of increasing interest among scholars and collectors everywhere.

## NOTES

1. Helmholtz, Hermann von. *Beschreibung eines Augen-Spiegels.* Berlin: A. Forstner, 1851.
2. See Robert Feibel, "John Vetch and the Egyptian Ophthalmia" *Survey of Ophthalmology* 28:128-134, 1983.
3. Donders, Franciscus Cornelis. *On the anomalies of accomodation and refraction of the eye.* London: New Sydenham Society, 1864.
4. Algarotti, Francesco. *Il Newtonianismo per le deme ovvero dialoghi sopra la luce e i colori.* Naples: [s.n.], 1737.
5. Voltaire, Francois Marie Arouet de. *Elemens de la philosophie de Neuton.* Amsterdam: J. Desbordes, 1738.

## AUTHOR

Christopher Hoolihan received his master's degree in library science from the State University of New York (SUNY) at Buffalo. From 1978 until July 31 of this year, Mr. Hoolihan served as Rare Book Librarian at Washington University School of Medicine Library in St. Louis. On August 15 he assumed the post of Rare Book Librarian in the History of Medicine Section of the Edward G. Miner Library at the University of Rochester School of Medicine and Dentistry in Rochester, New York.

# ANNOUNCEMENTS

## ASSOCIATION OF MUSEUMS TO BE FORMED

On May 16 in Durham, North Carolina, the first major steps were taken toward the formal organization of an association of museums devoted in all, or in part, to the history of the health sciences.

As health sciences history museums have grown in number and size throughout the last twenty years, consideration of such an organization and how it might be helpful to those engaged in this work has occured to many people. The specific plans that led to this meeting began at the Howard Dittrick Museum of Historical Medicine in Cleveland in the fall of 1984. Patsy Gerstner and James Edmonson had become involved some months earlier with the European Association of Medical History Museums, a group now in its third year. The European Association readily accepts members from North America, and in fact encourages such membership, but the distances separating the two continents suggest that active and regular American and Canadian participation will be unlikely. Nevertheless, the contact with other persons working in health sciences history museums created by this group was so appealing that it seemed only sensible that there should be a similar group in North America. Gerstner and Edmonson contacted about twenty of their colleagues around the country to determine if their feelings were mirrored by others. Through the winter months it became obvious that there was interest and the list of possible participants in an association grew as those contacted added to an initial list of names. Since many of

the people contacted are members of the American Association of the History of Medicine and were planning to attend the annual meeting of that group in Durham, a meeting time was planned for a free evening in the AAHM schedule.

Thirty persons, including museum curators and directors, librarians and collectors representing twenty-four historical collections were present. Attendees agreed that there were many issues that confront staff of museums in general and of health sciences history collections in particular, and the opportunity to discuss such issues as a group and to share information through a newsletter warranted the formation of an association.

Several issues of common concern were identified in the early correspondence that preceded this meeting and other issues were added during discussion. Among these issues are such internal matters as classification and subject indexing of collections, cataloguing procedures, standard terminology, and the identification of duplicate items. Among the often mentioned concerns that have to do with the public were the possibility of developing travelling or loan exhibits to be shared by members, the referral of donors to those museums where their donations would best fit the nature of the collection, and the need for information on object appraisal, especially the development of a list of qualified appraisers that can be shared among our museums. A newsletter was high on the list of needs. Although this organization will bring those involved in medical history collections closer together, a newsletter will be the vehicle that keeps the members in most frequent contact.

A good deal of time was given to discussions of what the next year holds in the way of planning, both for the formalization of this group and for a program. With regard to the latter, it was decided to meet again next year at the time of the annual meeting of the American Association of the History of Medicine, to be held in May in Rochester, New York. A number of possibilities for a program were discussed, including a joint meeting with the Association of Librarians in the History of the Health Sciences, whose members will meet in the Margaret Woodbury Strong Museum for a close look at the Strong Museum's computerization of collections. A business meeting will certainly be held and a workshop on one of the topics of concern noted above may be a third component of the meeting. A program committee consisting of James Edmonson (Howard Dittrick Museum), Michael Harris (National Museum of American History), Robin Kipps (Colonial Williamsburg), and Lucretia McClure (Edward G. Miner Library, University of Rochester) will develop the program details over the next several months.

A by-laws committee will be hard at work, too. Members of this committee are Daniel Bennett (Armed Forces Institute of Pathology/Medical Museum), Mark Dreyfuss (National Museum of American History), Mary Ann Hoffman (Wright State University), and Nancy Zinn (University of California at San Francisco). Among the many issues this committee will deal with are membership structure and fees, frequency and form of meetings, and the group's relationship with groups such as the European Association of Medical History Museums.

For this next year of organization Patsy Gerstner has been elected chairperson and James Edmonson secretary-treasurer. Dues of $3.00 per person were set to help pay for postage, etc., during this first year. Lisa Dziabis (The Pearson Museum) generously volunteered to help with a newsletter and many others offered to help in any way they might be needed.

In the next few months work will begin on the by-laws for study and approval at the meeting in Rochester, the determination of the first program, and the launching of a newsletter. From the initial group of thirty people and twenty-four institutions, membership is expected to climb steadily. Those people contacted earlier who were not able to be in Durham will be contacted again and the current working list of about seventy-five museums will grow with the addition of information from members.

Representatives of these twenty-four historical collections attended the organizational meeting:

University of North Carolina, Health Sciences Library (Chapel Hill)
Wright State University, Health Sciences Library (Dayton)
History of the Health Sciences Library and Museum, University of Cincinnati
University of California at San Francisco, Special Collections
Yale University Medical History Library (New Haven)
Colonial Williamsburg, Pasteur-Galt Apothecary (Virginia)
Johns Hopkins Institute for the History of Medicine (Baltimore)
Armed Forces Institute of Pathology Medical Museum (Washington, D.C.)
East Tennessee State University, Quillen-Dishner College of Medicine (Johnson City)
The Pearson Museum, Southern Illinois University School of Medicine (Springfield)
University of Western Ontario, The Medical Museum (London, Ontario)
Suffolk Academy of Medicine (Long Island, New York)
Los Angeles County Medical Association Library

Country Doctor Museum (Bailey, North Carolina)
Bakken Museum of Electricity in Life (Minneapolis)
Howard Dittrick Museum of Historical Medicine (Cleveland)
National Museum of American History (Washington, DC)
Mutter Museum and College of Physicians (Philadelphia)
Waring Historical Library and Macauly Museum of Dental History (Charleston, South Carolina)
Indiana Medical History Museum (Indianapolis)
St. Louis Science Center (Missouri)
Edward G. Miner Library, University of Rochester (New York)
Academy of Medicine, Toronto, Ontario, Canada

If you would like to join this organization or know of a small museum collection that may have escaped our attention, please let one of the officers hear from you. Patsy Gerstner and James Edmonson can be reached at the Howard Dittrick Museum of Historical Medicine, 11000 Euclid Avenue, Cleveland, Ohio 44106, 216/368-3648.

# EXHIBITS

## ONGOING EXHIBITS

### *Indiana Historical Society Features Miles Laboratory Exhibit*

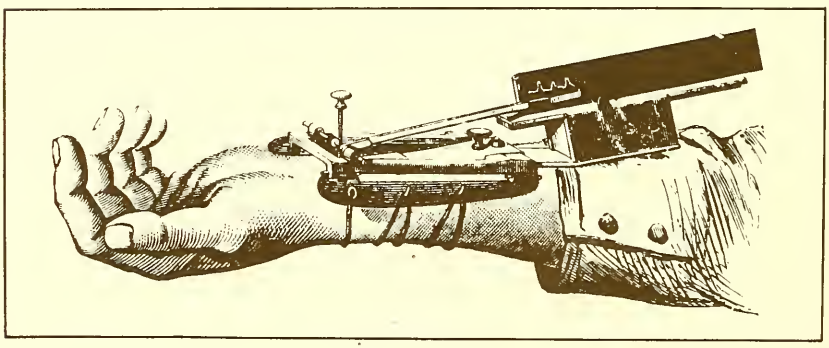
Currently on display at the Indiana Historical Society in Indianapolis are artifacts, business documents and photographs highlighting the first 100 years of Miles Laboratories, the Elkhart-based manufacturer of health and medical products. In 1884 Dr. Franklin L. Miles founded his Dr. Miles Medical Company to market his well-known home remedies. Since that time, the small Midwestern proprietary business has been transformed into a large research-based pharmaceutical company with annual sales topping $1 billion. Some of the more well known of Miles' over-the-counter products are Alka-Seltzer,® Bactine,® and One-A-Day® vitamins.

For more information on this historical exhibit, contact Lu Ann Howard at the Indiana Historical Society, (317)232-1877. The exhibit, which began June 10, will continue through October 18 in Indianapolis.

*Permanent Exhibit at Bakken Library*

On June 25 the Bakken Library of Electricity in Life in Minneapolis officially opened a new permanent exhibit entitled "The Graphic Method," an examination of the rise of physiological instrumentation and its clinical application from 1850 to 1920. Beginning with Carl Ludwig's kymograph (essentially a rotating drum), which was introduced into physiological instrumentation in 1847, the exhibit illustrates the profound effects that this method of scientific investigation had on biological studies. Ludwig's drum made possible for the first time the visual recording of physiological events in an objective and continuous fashion. In the 1860s and 1870s, Frenchman Etienne Marey developed the technique and went on to record a host of physiological phenomena resulting from blood pressure changes, muscle contraction, nervous conduction and cardiac activity. Marey dubbed this style of physiological investigation "the graphic method." The Bakken exhibition details the way these recording devices were adapted to record specific physiological events and how they were used in a clinical setting in the early part of the twentieth century.

For more information, call John E. Senior, Director of the Bakken Library of Electricity in Life at (612)927-6508.



Drawing of Marey's sphygmograph, used in recording the pulse. (from Etienne Marey's *La Methode Graphique,* Paris, 1878.) Part of the current exhibit entitled "The Graphic Method" at the Bakken Library of Electricity in Life.

*Cleveland Health Education Museum*
*Announces New Exhibit*

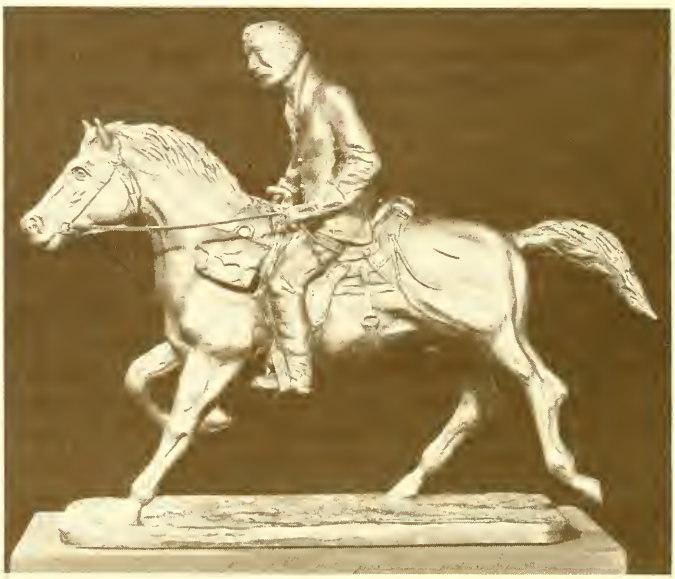
"Awareness '85: Your Changing Senses" is the title of a new exhibit on display for the next four months at the Cleveland Health Education Museum. This major multi-media exhibit gives visitors a first-hand glimpse into the world of change associated with growing older. The three components of the exhibition are: "What About Aging? Your Changing Senses," developed by the Rehabilitation Research and Training Center in Aging, University of Pennsylvania School of Medicine, The Franklin Institute Science Museum and Smith-Kline Beckman Corporation; "Images of Old Age in America," developed by the Institute of Gerontology, University of Michigan; and "Aging Well, Living Better," designed by the Benjamin Rose Institute of Cleveland. A professional workshop in conjunction with the exhibit, "Spiritual and Ethical Issues of Aging," was held on September 18 and featured Monsignor Charles Fahey, Director, Third Age Center, Fordham University, New York and Robert White, M.D., Ph.D., Director of Neurosurgery, Cleveland Metropolitan General Hospital.

Call Kevin Blanchet at the Cleveland Health Education Museum for further details, (216)231-5010. The exhibit, which opened September 1, will run through December 31.

LIMITED EDITION BRONZE SCULPTURE

# DOCTOR ON HORSEBACK

By
Gordon Peckham



A specially commissioned bronze sculpture entitled Doctor on Horseback is currently available in limited quantity from The Pearson Museum. The creation of former Curator Gordon Peckham, the bronze sculpture represents the "country doctors who traveled the prairies on horseback to care for the sick and injured during the 1800s."

For more information, contact: Curator, The Pearson Museum
SIU School of Medicine
P.O. Box 3926
Springfield, Illinois 62708

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The Medical Humanities Series is devoted to publication of original or out-of-print materials relating to perceptions the humanities bring to clinical practice and health care. In this way the Series also serves to promote communication between clinicians, humanists and the general public. The Series is a project of the Department of Medical Humanities at Southern Illinois University School of Medicine. Titles in the Medical Humanities Series include:

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